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ALBERTA'S FORESTS

THE
DEPARTMENT
OF
LANDS AND FORESTS

THE GOVERNMENT OF THE PROVINCE OF ALBERTA

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ALBERTA'S FORESTS

ISSUED BY
GOVERNMENT OF THE PROVINCE OF ALBERTA
Department of Lands and Forests
HON. NORMAN WILLMORE
Minister
H. G. JENSEN
Deputy Minister

FOREWORD

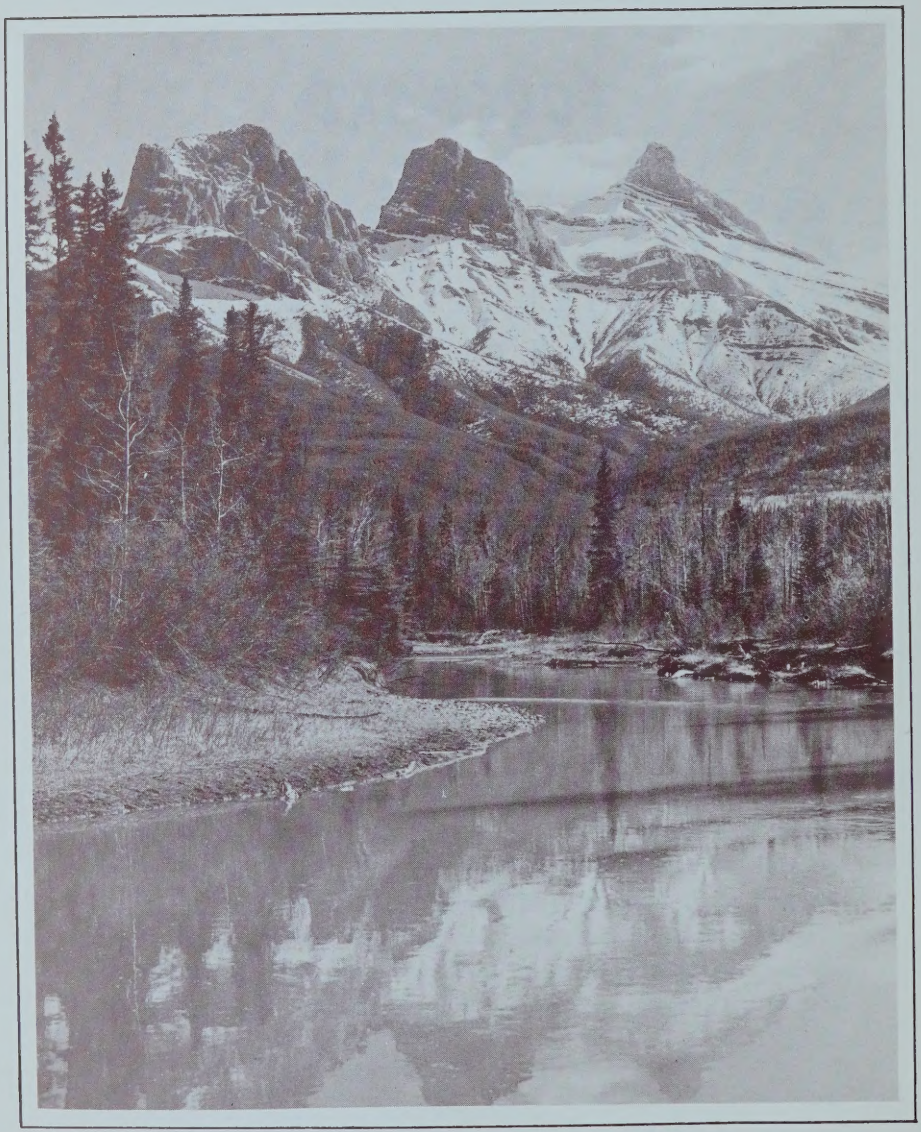
OF all our natural resources, other than land and water, our forests are the most valuable to the human race; they not only supply the lumber for our homes, buildings and a great variety of other construction, but they are the source of supply for our pulp and paper; they are the home of many of our birds, big game and other wild life; they provide park and playground, and last but not least, they protect the watersheds from which most of our water supply originates.

This booklet deals with this valuable resource and has been prepared in an endeavour to meet the many requests and general need for authentic information regarding the extent and importance of forests and forest administration in the Province of Alberta.

It is the responsibility of the Government and the people of the Province to work unitedly together with industry in an endeavour to conserve and preserve our forests. The Government appeals to all citizens to take their full responsibility in trying to prevent forest fires and in keeping our forests green, thereby maintaining a supply of timber, a home for our big game and other wild life and a playground, as well as assuring our water supply.

Without our forests Alberta would be a desert.

NORMAN WILLMORE,
Minister of Lands and Forests



THE GREEN FOREST

When you travel through the forest green;
Where elk and deer are often seen,

Or climb the crags where bighorn sheep abound;
And grizzly bear are sometimes found,

Hear a partridge drumming on a log;
See a bull moose feeding in the bog,

Listen to the coyote's mournful cry;
Watch an eagle circling in the sky,

Or thrill to the fight of a trout on your line;
In a stream that is shaded by spruce or pine,

Where the air is clear of city smoke;
And your only neighbours are forest folk,

Build your fire on rock or gravel clean;
And KEEP ALBERTA FORESTS GREEN.

HERB HALL.

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INTRODUCTION

ALL TOO OFTEN the mention of the word "Alberta" leads to visions only of snow-capped mountains, cattle ranches, rich fields of wheat, the Calgary Stampede, oil wells and the Edmonton Eskimos.

How often is thought given to a grove of spruce trees offering a cool retreat on a hot summer's day; or to a grove of poplar with their leaves of waxed gold shining on a sunny autumn afternoon; or to a stand of regimental pines sheltering a herd of deer; or to an aspen with soft green buds pushing open in welcome to the returning wildfowl?

That the forests are important in the economy of Canada as a whole is generally conceded and widely publicized. What has not been as well recognized is the importance of the forest to Alberta. Each year the forest provides the raw material necessary to sustain our hundreds of forest products industries. These in turn employ thousands of Albertans and provide millions of dollars in wages and in value of products produced.

The economic importance of the forest is a tangible thing that can be easily understood. The forest is equally as important in a sense that cannot be measured in terms of dollars and cents for the beneficial results it conveys.

The control of the prairie rivers is dependent on the forests along their headwaters. This means that most of the agricultural area of the prairies relies upon forests for the moisture upon which the soil in turn depends. It means that the prairie cities and towns depend on the forest to regulate and maintain the flow of water so necessary for industrial use and the many domestic uses from drinking and washing to lawn watering. It means control over the level of lakes where commercial fishing is carried on and of flowing streams, from tiny rivulets where cattle drink, to mighty navigable streams like the Athabasca, and to the tumbling cascades where power is generated for harvesting for industrial and domestic use. It means shelter for all wildlife. On the forest the very life of the nation depends.

The forests provide employment . . .

. . . shelter for our game animals

Of Alberta's 255,000 square miles, over 171,000 of them can be classed as forested lands. In other words, over two-thirds of ALBERTA IS FOREST LAND!

In fact, Alberta possesses the fourth largest forest area amongst the provinces of Canada. With the exception only of Texas, any one of the 48 United States could be placed inside our forest area quite handily! Another comparison that could be made is that our forest area is more than one and a half times the whole area of Great Britain.

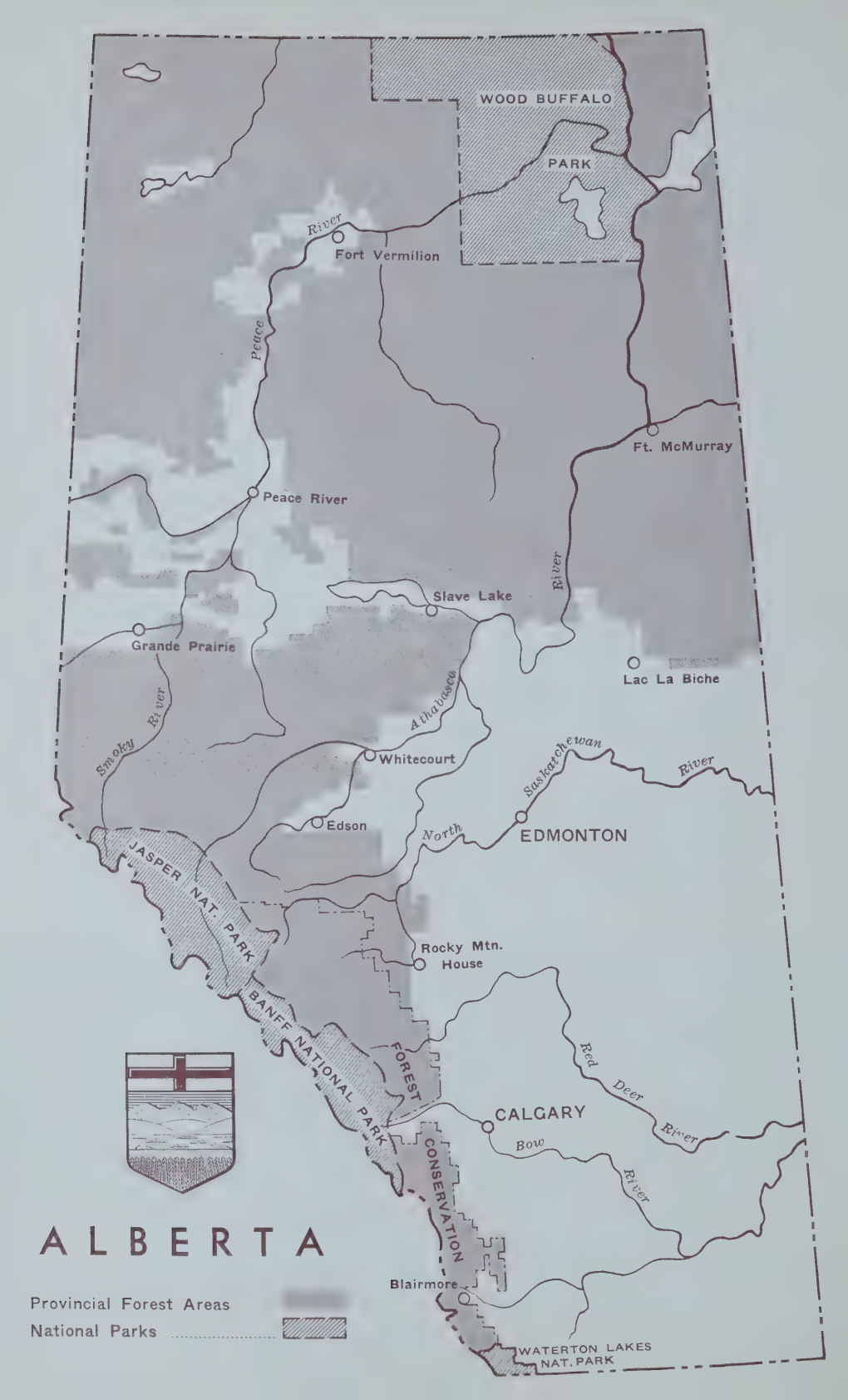
We have a wonderful heritage in our forests but we also have a great responsibility towards them. For, as the Vice-President and General Manager of the Royal Bank of Canada said in his annual address in 1949: ". . . we are only the temporary trustees and custodians of our vast resources and endowments . . . that we are in fact duty bound to develop these resources and endowments and deal with them in our day for the greater good of generations yet to come."

Fires annually cause millions of dollars damage to our forests, but fire is not the only danger to which the forest is exposed. From its deepest root to its topmost twig the tree, throughout its life, is under constant danger of attack by insects and disease. Although not as spectacular as fire, the loss of timber by these causes is still extensive enough to warrant serious consideration. In some parts of Canada the loss through insects and disease actually exceeds that of fire.

Reasons for carefully designed policies of conservation now become apparent, but conservation is not something which governments can carry out single handed; governments are helpless without the co-operation of the people who, basically are most vitally concerned.

The Forests and Wildlife Division of the Alberta Department of Lands and Forests is equipped for the management of our forests and for their protection from fire, from insects, and from disease. But, prevention is better than any amount of correction. This is where people themselves can assist our Forest Service in caring for the forest. How they can help will be shown, among other things, in the pages which follow.

. . . and they help to control the prairie rivers.


WOOD BUFFALO
PARK
River
Fort Vermilion
Peace
Ft. McMurray
Peace River
River
Slave Lake
Grande Prairie
Lac La Biche
Athabasca
Smoky River
Whitecourt
Saskatchewan
River
Edson
North
EDMONTON
JASPER NAT. PARK
Rocky Mtn.
House
BANFF NATIONAL PARK
FOREST
CONSERVATION
Red Deer River
CALGARY
Bow River
ALBERTA
Provincial Forest Areas
National Parks
Blairmore
WATERTON LAKES
NAT. PARK

HISTORICAL

THE HISTORY of the forests extends millions of years back in time, long before the appearance of man. Even the lumbering dinosaur found ample food in the leaves of the large fern-like trees of his time.

As the human family grew it demanded wood for shelter, fuel and weapons. The early demands made negligible impression on the forests but as civilization progressed the forests began to suffer. Many places that once supported dense tree growth are now barren semi-deserts. It took many centuries to impress man with the vital need of a scientific approach to tree culture and conservation. It is still less than a century since forestry attained the status of a science. Birthplace of good forestry practices was central, northern and western Europe and there the most advanced forestry practices in the world are to be found to this day.

The horse is still a valuable form of transportation.

In North America, logging was probably the first commercial activity of white men. Old Norse accounts tell that Leif Ericson and others went to the shores of a land across the North Atlantic and brought a cargo of timber about the year 1000 A.D. There is record of a timber-laden ship, homeward bound from "Markland" to Iceland that was wrecked in 1347 just before it reached port.

The forests on what is now Alberta came under the control of the federal government in 1869 when the Hudson's Bay lands were returned to the Crown. This was followed by a great rush of settlement into the new lands of the west that only slowed down during the war years of 1914-18. The forest policy during these years was naturally in favour of the farmer. Even so, the forestry men of that time were aware of the need of protecting and managing the western forests.

Canoe patrol on the Athabasca in early days.

Control of Crown Lands, including forests, was vested in the Secretary of State in 1871 and transferred to the Department of the Interior in 1873. The necessity for conservation of the forest resources of the West was further recognized in 1899 by the appointment of an officer known as the Chief Inspector of Timber and Forestry. This appointment is considered as the beginning of the federal Forestry Branch.

It is interesting to note that even before the days of the Forestry Branch, the timber regulations generally embodied the same principles which influence the administration of Crown timber at the present time.

Under the direction of the Chief Inspector, the new service proceeded to inspect existing forest reserves, make suggestions for new ones and make recommendations for the improvement of fire protection. A tree nursery was set up in Brandon to supply planting stock to farmers for shelter-belts. The work was centralized at Indian Head, Saskatchewan, in 1904 and has continued to this day.

Speeders are still very useful in checking on railway fires.

In 1906 Parliament passed a most important Act respecting Forest Reserve purposes of which were cited as (1) the reserving of timber supplies, (2) the reserving of areas unsuited to agriculture so that they would not be homesteaded, and (3) the preserving of the water level in streams by conserving the timber on the upper watersheds.

The same year was notable also for the establishment of Cypress Hills and Cooking Lake Forest Reserves under the Forest Reserves Act. Their "reserve" status kept them from settlement and provided for more intensive forest protection and management.

In the year 1906 there was an increasing awareness of the forest as evidenced by the Canadian Forestry Association's convention in Ottawa over which the Prime Minister, Sir Wilfred Laurier, presided.

In 1908 the Dominion government brought about an important change of policy regarding the sale of timber berths. It had been the practice to sell large western tracts without any examinations or "cruise" being made, which often resulted in the purchase of whole watersheds regardless of the amount of timber. Under the new policy the area applied for had to be surveyed and cruised before being offered for sale. This policy has been continued to this day. Auction of timber was also started at this time.

In 1910 a survey was made to determine the eastern boundary of the Rocky Mountains Forest Reserve. The survey extended from the United States border to the North Saskatchewan River. The Forest Reserves Act was replaced by the Forest Reserves and Parks Act in 1911 and the Rocky Mountains Forest Reserve was set up in the same year. This reserve was divided into five forests — Crowsnest, Bow River, Clearwater, Brazeau and Athabasca. A forest supervisor was placed in charge of each forest and ranger districts and fire patrols were set up within each forest.

The Lesser Slave Reserve was established in 1913, comprising 5,023 square miles. In the same year grazing was allowed on the reserves, mostly on the Crowsnest and Bow River, and two hundred permits were issued representing from 15,000 to 20,000 head of stock.

By the end of 1914 there were 33,666 square miles of forest reserves in the Prairie Provinces of which 23,428 were in Alberta.

From then until 1918 work of organizing the Alberta Forest Reserves included the construction of 2,000 miles of roads and trails, 350 miles of telephone line, buildings for 20 ranger stations and 50 smaller cabins. In 1920 aircraft were used for the first time for fire patrol and detection, and a temporary aerodrome was set up at Morley. This aerodrome was discontinued in 1921 and a larger

Forestry work has been greatly helped by aerial patrols from the 1920's on.

An early lookout on the Brazeau Forest.

one established at High River. At the same time a wireless was set up and small sets were placed in patrol planes. The work carried out by this early air service proved most valuable.

The next important change came in 1930 when the natural resources were taken over by the province and forests became the responsibility of the provincial government. The set-up remained about the same and the staff for the administration was largely recruited from personnel of the Dominion Forest Service and Crown Timber and Grazing Branch who were already acquainted with the work and with the country. The Dominion Forest Service retained an office in Calgary for the purpose of carrying on the research work that they agreed to do.

The area coming under the new provincial organization comprised over 160,000 square miles — about 148,000 square miles in the Edmonton Fire Ranging District and the rest in reserves.

In 1932 the need for economy compelled the cutting down of the staff set up by the provincial government. The Lesser Slave Lake Reserve was done away with and the area placed under the Northern Alberta Forest District. The Crowsnest and Bow River; and the Brazeau and Athabasca reserves were combined. This eliminated three reserve offices and reduced the number of supervisors from the original seven under the Dominion service to three under the new provincial service.

Absorption of some of this personnel was made possible by the Forest Service taking over administration of the timber branch. The number of rangers on permanent staff on the reserves was reduced to eight while the Northern Alberta Forest District had no permanent rangers at all. Most rangers were hired on a seasonal basis for a period of from six to eight months and were laid off during the winter. The situation began to improve in 1941 and in 1943 all rangers were placed on the permanent staff.

From then it became increasingly apparent that even in a good fire year the limited permanent staff was having a good deal of difficulty in keeping up with the amount of improvement work in the forests; and at the same time properly supervising timber cutting, grazing, campers, fire patrol and other duties connected with their positions as ex-officio fish and game wardens.

With this problem in mind the field staff was gradually increased from 48 forest officers in 1945 to 121 in 1955. Considering the vast area administered, it meant that each of the 71 district rangers was still

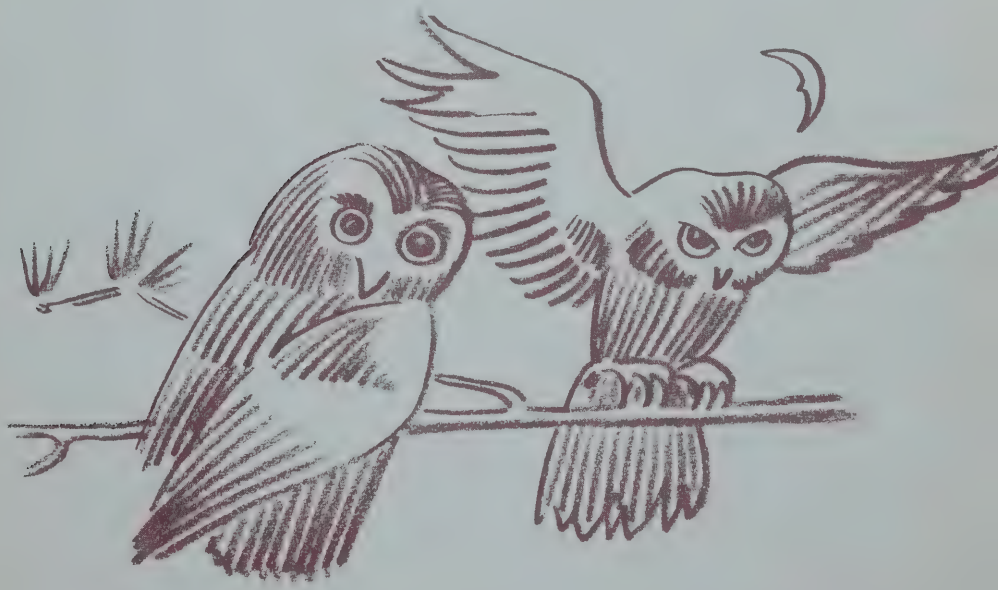
responsible for an average of 2,000 square miles each. Needless to say, the organization will continue to grow for many years to come.

In 1948 the Crowsnest, Bow and Clearwater forest reserves were set up under joint provincial and federal control under the jurisdiction of the Eastern Rockies Forest Conservation Board. In the same year came an order-in-council setting aside a permanent "Green Zone" or forested area on which settlement would not take place. This action ensured that in the future the homesteader would not starve on submarginal land and that good forest land would not come under the plow. Since that time, settlement has been allowed in an orderly fashion on areas where soil surveys have shown that farming is feasible. With the increased activity in forestry, lands, mining, and soil, the old Department of Lands and Mines found itself over-burdened. In 1949 it was split into two new departments of which the present Department of Lands and Forests is one. That year a contract was made with the Photographic Surveys Corporation to obtain aerial photographs and maps of the province. P.S.C. also agreed to make an inventory of the forested area south of township 92 excluding the Conservation Area. The inventory was completed in 1953 and the Forest Surveys Branch of the department then started the inventory north of 92.

Uniforms were worn by forest Officers for the first time in 1949. These distinctive uniforms are now a well-known mark of the field man.

The Forestry Training School was established in 1951 in order to round out the knowledge of the field men. A ten-week school has been held every fall since.

The present organization of the Forests and Wildlife Division was put into effect in 1953 on the recommendation of the report of a team of efficiency experts. The changes have provided for more efficient administration and will allow the division plenty of room to grow.



"From southern foothills . . .

THE FOREST

AS HAS BEEN pointed out, well over half of Alberta consists of forest land. Most people travel through this province by car or train and a glance at the map will show that these routes of travel are mostly located in the agricultural areas. The forest is then out of sight of most travellers, and its great extent not appreciated.

Starting at the International Border at Waterton National Park the forest runs northerly along the eastern slopes of the Rocky Mountains spreading out over the foothills as it progresses. It spreads northward to the Athabasca River, then makes a circle to the east crossing into Saskatchewan near Primrose Lake. The forest then marches north into the North-west Territories in a virtually unbroken front from border to border except for the fertile lands it has left in the "Peace River" country.

This area of forest is not entirely composed of majestic timber, though. The tree population is as varied as our own population, representing trees of all ages, sizes, shapes and races. All are useful in their own way.

The forest may take the form of a stand of fence-post-size larch in a low swampy hollow; the light green needles in sharp contrast to the neighboring black spruce and the thick, dark coloured blanket of moss which makes walking so difficult.

On one side of the swamp may be a ridge supporting a stand of young, fast growing pine or spruce with nothing but a carpet of pine-needles on the ground. This type of stand is what tomorrow's logging chance is made of.

By way of contrast, on the next low ridge may be a patch of large but ancient spruce that has grown over-ripe and has deteriorated into a tangled jungle of windfall, brush, snags, twisted roots and rampant herbs. For trees, as any other living thing, will become diseased, attacked by insects, battered by the elements and weakened with age until they fall, victim to some vagrant breeze. Present forest management policies are intended to ensure that stands are harvested before they become too old and useless.

Some trees will make lumber, others will make railroad ties, telephone poles, fence posts, pulpwood, plywood or any of the many other products that can be made from trees.

The small scrubby trees up on the mountains will probably never be cut for forest products, but their roots help to hold the soil and keep it from eroding down to pollute our streams. Their branches break the force of the rains in summer and shelter the snow drifts in the spring, thus helping to prevent spring flooding and at the same time supplying water later in the season to keep the streams from drying up.

In many places the forest gives way to open muskeg where moose may often be seen feeding. It is all nature's way, however, and these insects that bother us so much provide food for our many native birds and things balance out fairly harmoniously. But the muskeg also has a very practical function, serving as one of nature's reservoir systems, a moisture "sponge" that is the source of many watershed systems and in its own way regulates stream flow.

The surface of the forest's green mantle has been broken in many places by fires that have destroyed the results of decades of tree growth. Some of these areas have been burned so badly that they now lie bare with only the odd clump of brush to cover the scar. It will be a long time before trees grow here again.

Inventory figures reveal that about 70% of the area in the Forest and Wildlife divisions is either forested at present or is potentially capable of supporting forest stands. The remaining portion consists of such non-productive areas as muskegs, water or bald rock. The same inventory also shows that roughly half of the presently forested areas are covered with coniferous growth such as spruce, pine or balsam, while the remaining half supports deciduous species like aspen and poplar. The trees may form pure stands or they may grow in mixture with each other. Most species range throughout the entire forested area.

. . . to the north"

Part of the Grande Prairie divisional headquarters.

BUSINESS OF FOREST

THE PROVINCIAL Department of Lands and Forests, formed in 1949, is broken into three main divisions, Lands division, Technical division, and the Forests and Wildlife division.

The Forests and Wildlife division bears the brunt of responsibility for looking after the forests, fish and wildlife.

For ease in administration the forested area of Alberta is divided into seven areas called Forest and Wildlife Divisions with divisional offices located at Peace River, Grande Prairie, Edson, Whitecourt, Slave Lake, Lac La Biche and Rocky Mountain House; and one Conservation area along the east slopes of the Rockies with headquarters at Calgary.

The positions of Director of Forestry and Fish and Game Commissioner are presently held by one man. To help him handle this large scope of activities is an organization of branches designed to cover specific aspects of the work. While primarily concerned with their own problems, the branches all work together, each one helping the other in the common aim of protecting, managing and perpetuating our forests, fish and wildlife.

The Administration branch has as its general function the supervision of all branches, maintaining general control over revenue and expenditures, and dealing with personnel. Although the branch has little direct contact with forestry itself, it is an essential unit in the forestry organization.

FOREST PROTECTION BRANCH

THE FOREST PROTECTION BRANCH is concerned mainly with preventing forest fires, finding them when they break out, and putting them out when they are found.

Since all the field staff comes under the supervision of this branch, it must also concern itself with construction projects such as forestry roads and trails, cabins, equipment caches and lookout towers. The field staff themselves have many other duties as will be shown.

As can be seen from the chart, the forest protection branch is headed by a senior superintendent and an assistant. These two men are located at Edmonton and keep the Forest Protection organization well co-ordinated and running smoothly. It is also their function to seek out and test new protection equipment as well as developing new ideas along these lines. For instance, the Forest Protection branch in co-operation with the Edmonton Transit System has pioneered the development of fiberglass cupolas for use on steel lookout towers. The new type of structure is much lighter and stronger, more durable, and provides more window space than the usual one. All new towers are being finished with them.

The new fiberglass cupolas are lighter, stronger and more durable than the older ones.

Depending on the size of the Forest and Wildlife division, the Forest Superintendent may have one or two Assistant Superintendents, a forester and one or two Chief Rangers to help him out. These men are responsible for the ranger staff, standby crews, towermen, patrolmen, fire protection and for all forest activities carried on in their areas.

The Forest Wildlife divisions are in turn subdivided into Ranger districts with a Forest Officer, or Ranger

as he is commonly known, in charge of each. These men, who are responsible to their respective Forest Superintendents, are the backbone of the whole Alberta Forest Service.

They are the men you most commonly meet during your travels in the bush. The Forest Officer is the one who does all the leg work in his district. He is the man who has to round up fire-fighting crews and put out the fires in his district as well as the many other duties he is expected to look after.

The Forest Officer is a Jack of All Trades and master of nearly all of them. He is a fire fighter, a timber cruiser, a public relations man, a sawmill inspector, a logging operation inspector, a construction engineer, a surveyor and in some places a horse packer. He is a fish warden and a game warden. He must supervise the trapping in his district, he must assess the damage on seismic lines and oilwell sites. All these and many more are the activities of a Ranger.

Another man you may meet in the field is the divisional Forester. These university-trained men are located at the divisional headquarters to help out primarily in the timber work, but can be called on by the superintendent to give a hand with any other type of work that may arise.

The primary purpose of the Forest and Wildlife Division is fire prevention and control. The Ranger is the man who looks after the actual fire fighting, right on the ground. Men are hired just before the spring break-up to help in fire spotting. In a few places patrolmen are hired who patrol a given piece of country looking for smokes and checking on campers and other forest users.

Over most of the forest area there is a network of lookout stations established with a lookout man at each point. These men are equipped

Portable radios help the Ranger to co-ordinate fire-fighting tactics.

with fire-fighting equipment, maps and two-way radios. It is their duty to keep a constant lookout for any smokes and to report them immediately so that action may be taken on them before they get too big to handle easily. The lookout man also gathers meteorlogical information and acts as a member of the Ground Observer Corps but his primary duty is to spot and report smokes accurately and quickly.

Men are also hired to stand by at certain places of high hazard in order to take immediate action on reported smokes. These are called Standby Crews. It is their purpose to take the first action on a fire to try to put it out or keep it under control until a regular fire-fighting crew can be recruited and brought in. When a crew has been brought in to help fight a fire, the standby crew returns to its base of operations ready to go out again at a moment's notice on any other fire. In periods of slack times they are employed on construction projects and other work.

The Forest Management Branch looks after timber matters.

FOREST MANAGEMENT BRANCH

THE FOREST MANAGEMENT BRANCH and most of its personnel are located in Edmonton. This branch sets the standard of timber utilization, supervises the cruising and selling of timber, the method of cutting, sees that the mills are operating efficiently and that the dues payable to the crown on timber sold are collected.

With the new forest management policies of the province this branch will be responsible for putting the management plans into effect.

In addition, the branch determines the general schedule of dues which reflects the mill value of the forest products and is assessed annually. Other functions include the disposal of applications for mis-

Forest Officers keep a close check on timber operations in their districts.

Skilled photogrammetrists interpret aerial photographs for timber work.

cellaneous uses of land in the green zone, informing the public as to all aspects of timber administration and our forests in general, and co-ordinating and assisting in entomological, pathological and forest research and products studies.

A fairly recent duty has been to assess the timber damage and land disturbance on seismic exploration surveys and right of entry in the green zone, and to submit accounts to the parties involved.

In charge of the branch is a Senior Superintendent who at present is also the Assistant Director of Forestry. He is assisted by an Assistant Superintendent. Under the Superintendent and his assistant are two sub-branches: the timber Administrative Officer and the Audit Branch.

The Timber Administrative Officer is concerned with the selling of timber and overseeing the men in charge of processing timber berths and miscellaneous permits to cut timber. He is also concerned with accounts relative to timber returns.

The Audit Branch consists of the four Timber Auditors. Three of them work out of Edmonton, while the fourth is located in Peace River. These men visit mills and lumber yards in Alberta to check the sales returns to ensure all dues payable to the government are being paid.

The field staff under the divisional Forest Superintendents are usually asked to handle the woods end of the timber work right from the first cruise through the mill inspections and the final examination of the cutting area before the berth or permit is cancelled.

FOREST SURVEYS BRANCH

THE FOREST SURVEYS BRANCH is the technical forestry branch of the Forest and Wildlife division. The man in charge of this branch, as in all branches, is called the Senior Superintendent and he also has an Assistant Superintendent to help him out.

Included in the staff of this branch are several Forest Engineers, university-trained men well versed in the theory and practice of forestry; skilled photo-interpreters called Photogrammetrists who prepare most of the maps for timber sale work; and many competent draughtsmen and compilers.

The work of this branch can be divided into three main categories: forest management planning, the forest inventory and forest cover map making for timber sale and fire damage evaluation purposes.

In charge of forest management is the assistant superintendent. He is a trained forester and his calculations are designed to show how much timber can be cut from an area without depleting it. Planning for the orderly development of management areas in regards to roads, logging and protection is included in the calculations and is done in co-operation with the other forest branches.

The forest inventory is a major undertaking and the first broad, over-all picture has been completed. Under the forester in charge of inventory, plans are being made to increase the scope of the project to augment the information available about our forests. A later chapter will describe the inventory further.

Under the direction of the Photogrammetry and Compilation supervisor, forest cover maps are prepared. By studying aerial photographs under a stereoscope, the photogrammetrists are able to interpret the detail into terms of stands of trees, size of timber and topographical features such as lakes and streams. These photographs are then drafted into maps which are used in timber cruising, damage appraisal and logging.

RARE BIRD

The rarest bird
(Or so it seems)
Was the Honest Bird
Of our childhood dreams:
He never asked
For a bit of graft;
At a deal that was masked
He simply laughed;
He snapped his beak
At stealing a mite
Because he believed
That right was right;
From a shady scheme
He turned his eye . . .
Have you actually seen him?
Neither have I !

Arch Crawford

The Fish and Game Branch keeps Alberta's waters stocked with fish . . .

FISH AND GAME BRANCH

A SUPERINTENDENT of Fisheries and a superintendent of Game keep things moving in their respective fields.

To carry out the scientific studies necessary in a good wildlife program are university-trained wildlife biologists specializing in either fish or game. These men are constantly at work to find methods that will help to sustain and improve our hunting, fishing and trapping.

Since the Forest Officer is ex-officio Fish and Game officer, he does most of the wildlife enforcement work in the forested areas. The administration of all registered traplines is also the responsibility of the district Forest Officer or Ranger.

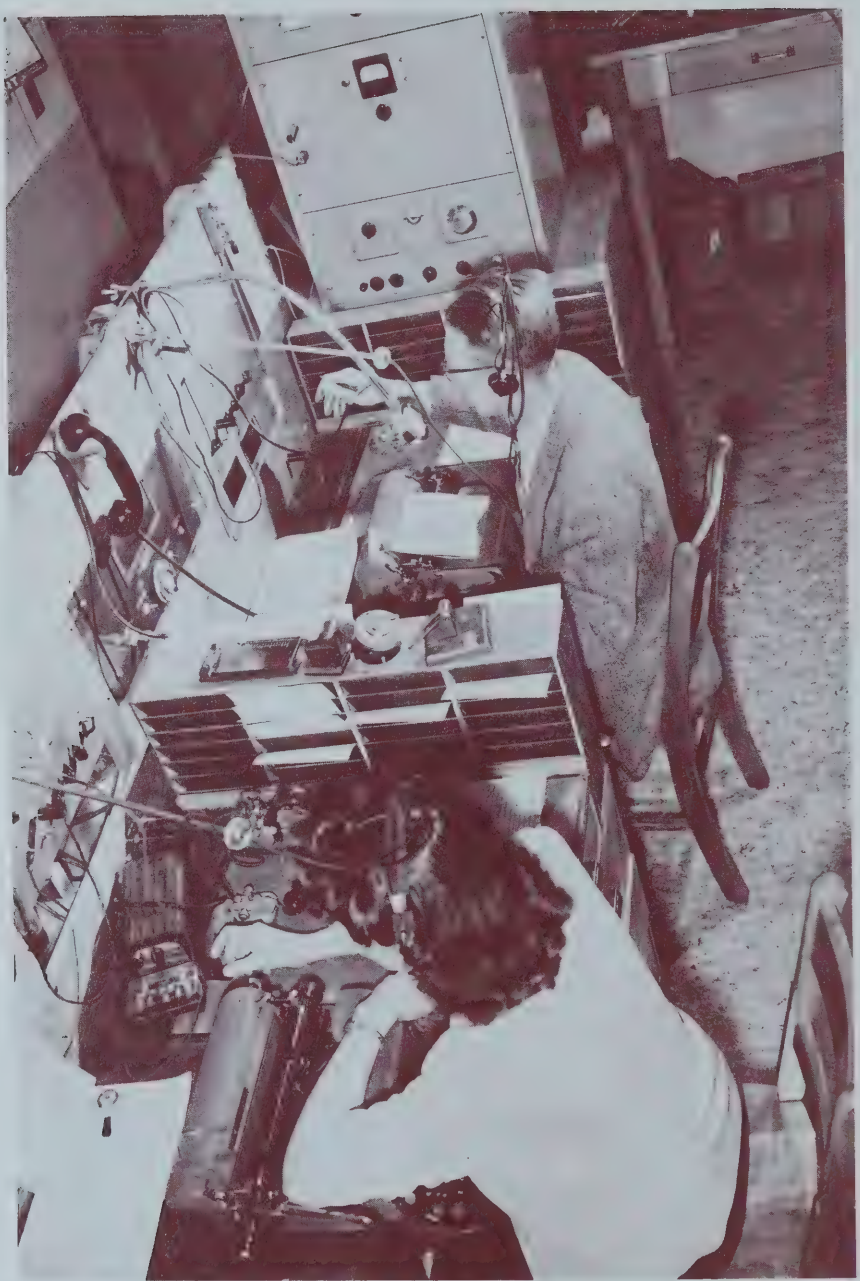
In the more settled areas, however, Fish and Game officers are given Wildlife districts in which they look after all fish and game matters.

The Fish and Game branch is responsible for the Wildlife over the entire province excluding Indian reserves, National Parks and other Federal reserves.

The branch, in addition to this, supervises the fish hatchery at Calgary which was donated by the Calgary Brewing and Malting Co. looks after the fish rearing ponds at Calgary and Raven, and sees to the planting of fish in proper locations.

The Provincial Pheasant Hatchery at Brooks is another charge of the Fish and Game branch and provides planting stock for the pheasant stocking program.

. . . and strives to maintain good hunting and trapping.



The forestry radio network keeps in touch with the field staff.

RADIO BRANCH

THE RADIO NETWORK can be likened to the "nerve system" of the Forest Service. The Radio Branch is responsible for developing and maintaining radio communications between all offices and personnel.

In addition to maintaining equipment currently in use, the branch is constantly striving to improve communication facilities by various means such as the use of frequency modulated "very high frequency" equipment (VHF FM) where feasible, improved design in "medium frequency" (MF) equipment and by the design of specialized equipment.

Each Divisional office has a radio operator who directs radio traffic within the division. A few radio technicians are located in the field as well.

Weather information is collected twice daily by radio and forwarded as a forecast service to the Meteorological division of the Department of Transport.

Since this branch operates the only government radio communication system in the province, it is often called upon to assist other departments when they take to the field. Much administrative traffic is also handled for all government departments.

FORESTRY TRAINING SCHOOL

SINCE THE FALL of 1951, twenty forest officers each year have been given ten weeks of intensive study at the Forestry Training school.

The school is held in the late fall at the Dominion Forest Experimental Station at Kananaskis, about 65 miles west of Calgary.

The Forest officers who attend the school are men chosen from the field staff who show promise of upholding the high standard of performance demanded by the Department.

Instruction is given by members of the staff of the Forests and Wildlife Divisions as well as by professors of the University of Alberta, senior men of the Eastern Rockies Forest Conservation Board, Dominion Forest Service, Forest Biology Labs of the Dominion Department of Agriculture and many others.

The course is designed to give the forest officers an effective training in all phases of their important work. Included in the syllabus are courses in timber cruising and evaluation, fire protection and prevention, wildlife management, fish and game zoology, botany, survival and woodcraft, forest entomology and pathology, road location and construction, general construction such as bridges, buildings and towers, public speaking and law — just to mention some of them.

Field exercises give the students ample opportunity to practice what they have been taught. About a third of the 400 hours of instruction are spent on fieldwork.

RESEARCH ORGANIZATIONS

UNDER THE TRANSFER of resources agreement between the Dominion and the Province in 1930, the administration and protection of the forests was made the responsibility of the province of Alberta. The federal government agreed to conduct the research programs so vital to the development of sound forestry practices in co-operation with the Alberta Forest Service.

Research in the fields of forestry, forest products and forest economics is conducted by the federal Forestry Branch through its Alberta District office in Calgary.

Studies in forest entomology and forest pathology (insect and disease problems) are carried on by the units of Forest Zoology and Forest Pathology, Forest Biology Division, of the federal Department of Agriculture which are also in Calgary.

The Forestry Branch carries out many studies on the Forest Experiment Station at Kananaskis, but research is by no means confined to this one area. Forest conditions vary so greatly from place to place that experimental plots are of necessity located in all the major forest conditions of the province. In addition to work of an experimental nature the Forestry Branch also carries out province-wide fact-finding surveys on a variety of forestry problems. These include growth and yield studies, forest reproduction and volume table construction.

The Alberta District Office is responsible for most of the studies in silviculture and forest management in the province. Under the supervision of the District Forest Officer studies are also made by the Fire Protection section of Ottawa and by the Forest Products Laboratories division through its Vancouver laboratory. Implementation of the Canada Forestry Act with respect to Alberta is also administered through the Calgary office of the Forestry Branch.

Detection of harmful forest insects and diseases, and research into methods of controlling them are the main functions of the Forest Biology Laboratory. Primarily both units of Pathology and Zoology perform the function of research.

The detection phase of the work is incorporated into the nation-wide Forest Insect and Disease Survey. In Alberta there are six Forest Biology rangers each of whom has a definite district to cover. These men work in co-operation with both the Zoology and Pathology units. Investigations are assisted and often initiated by the staff of the Forests and Wildlife Division who will report cases of suspected insect or disease attack to the lab concerned.

The ultimate aim of all insect and disease research is to find economical and effective controls. Controls can be roughly classified into three systems, direct, biological, and silvicultural.

Direct controls include such methods as applying sprays or removing affected trees. These methods often work well but are sometimes too expensive or impractical for large attacks.

Research studies are necessary in order to improve our forestry practices.

In applying biological or natural control a natural enemy or disease of the pest is released in the affected area so that nature herself will decimate the population of the pest.

Silvicultural control means that the forest is managed in a sound manner so that the trees remain healthy and their susceptibility to attack by disease and insects is greatly reduced. This is included in the aims of the provincial forest management planning schemes.

The Forest Biology Laboratory maintains two field research stations for survey and research; one at Kananaskis, and the other, the Eisenhower Field Station, in Banff National Park. The present headquarters of the units of zoology and pathology are at Calgary.

In addition to Alberta the labs are responsible for the Rocky Mountain National Parks and the Northwest Territories.

A good servant, a cruel master.

FOREST DEPLETION

FIRE

FOREST FIRE. A raging red devil running loose in the woods. His voice is the roar of a thousand express trains, his costume is red, his footsteps hot black char, and his message written in a thick black cloud of smoke.

Where does this monster hide and how does he get loose? He can be found most anywhere, peacefully serving man in the form of a match, or as a campfire, or as the red glow on the end of a cigarette. He is peaceful only as long as he is kept servile. A moment's carelessness and he immediately grows to his new found freedom becoming wild and ugly and obsessed with his power. It then requires the utmost of effort on the part of many men to capture him, control him and finally to destroy him completely.

It is true that some fires are started by lightning but the figure is probably less than you might have thought. Considering the fires over the last five years, the causes were as follows:—

Human Causes	85%
Lightning	8%
Unknown	7%

Based on these same five years, fires sweep over more than 230,000 acres of forest and brushland every year destroying the equivalent of over 282 million board feet of timber. The damage caused by forest fires is estimated to be at least $7½ million yearly. What makes these figures sound even worse is the fact that 85% OF THE FIRES COULD HAVE BEEN PREVENTED!

When reports are being made of fires it is usually the timber loss that makes the headlines. Not very often is mention made of the more intangible losses, which of course are very difficult if not impossible to assess. For instance there are the nesting birds, the sleeping fawn or the squirrels and burrowing animals, terrified by the approaching roar and choking smoke, then suddenly seared by the white hot wall of fire.

And then there's the soil, lying exposed to the elements ready to be eroded down into the streams at the first rains. Or that favorite camping spot with nothing but a blackened snag to mark its location beside the stream that used to have such good fishing.

Often, too, a report might state that a fire is burning but that it is only burning in an old burn or in brush. Actually this fire may be doing more damage than a fire burning in timber. After a timbered area burns there is sometimes enough seed left in the ground or in cones to get a new crop of trees started fairly soon. But if this area should become burnt again there would be no seed and it would take many years to establish a forest again.

The Forests and Wildlife division maintains a well-trained forest fire fighting organization but it counts heavily on you, the citizen of the

Fire fighting is hot, dirty, back-breaking work.

province, in all three phases of the work — Prevention, Detection and Suppression.

It is already obvious how you can help in the prevention of fires. To see how important you are in detection of fires, look at these percentage figures of reported fires in 1955 :—

Fires reported by Forest Officers	25%
Look out men	37%
Public	30%
Railway	6%
Aircraft	2%

You can readily see then, that we Forestry people count on your help and appreciate your efforts very much.

An important device in helping to prevent fires from starting as a result of clearing fires is the burning permit. The permits are issued free of charge by a forest officer to anyone who wishes to burn brush in or near the forest area. Permits are only given when the weather is right for burning and when proper precautions have been taken to keep the fires from spreading.

At certain times of extreme hazard, the Minister of Lands and Forests may order the forests closed to everyone except those who make their living in the forest. This is done to help reduce the danger of fires starting accidentally and to give the rangers a better chance to keep their districts green.

The detection phase of the forestry organization is built around a network of lookout stations. At present there are 54 of these with more planned, especially in the northern areas which are becoming more important all the time. The percent of fires reported by lookout men may seem low but it must be understood that many fires are reported by them only a short time after a report has been received from some other closer

Fires not only destroy trees but these innocent forest dwellers as well.

source so that they do not get credit for it. The lookouts also are in a position to spot smokes well back into the forest zone.

When the lookout man sees a smoke he takes a sight on it with his fire-finder and then by means of a cross-shot from another lookout or by using his maps and photographs he plots the location of the smoke. Using his two-way radio, he immediately reports the location and all other information he can about the size, colour of smoke, wind conditions and so on, to his Divisional office.

The Forest Superintendent or his assistant will immediately get in contact with the forest officer in whose district the smoke is reported and advise him of conditions.

Possibly the stand-by crew will be alerted and within minutes they will be off to take the initial action.

Forest fires such as this are largely a result of human carelessness.

In the meantime the Forest officer will check his pre-suppression plans to see where the nearest equipment is located and where fire-fighting crews might easily be rounded up.

If the fire is fairly big, the ranger will assume the position of commander-in-chief and will have to supervise the entire operation from hiring men and equipment and taking them into the fire, arranging for food and shelter for them and keeping time records to direction of the main fire-fighting strategy. In this last respect he will depend heavily on his foremen and straw bosses.

Like any other battle it involves initiative, courage, imagination quick thinking, resourcefulness and skillful tactical employment of suppression crews and equipment.

There are three main kinds of forest fires. The crown fire raging through the very tops of the trees, the surface fire running along the

ground or the ground fire which burns under the surface as in the edge of a muskeg.

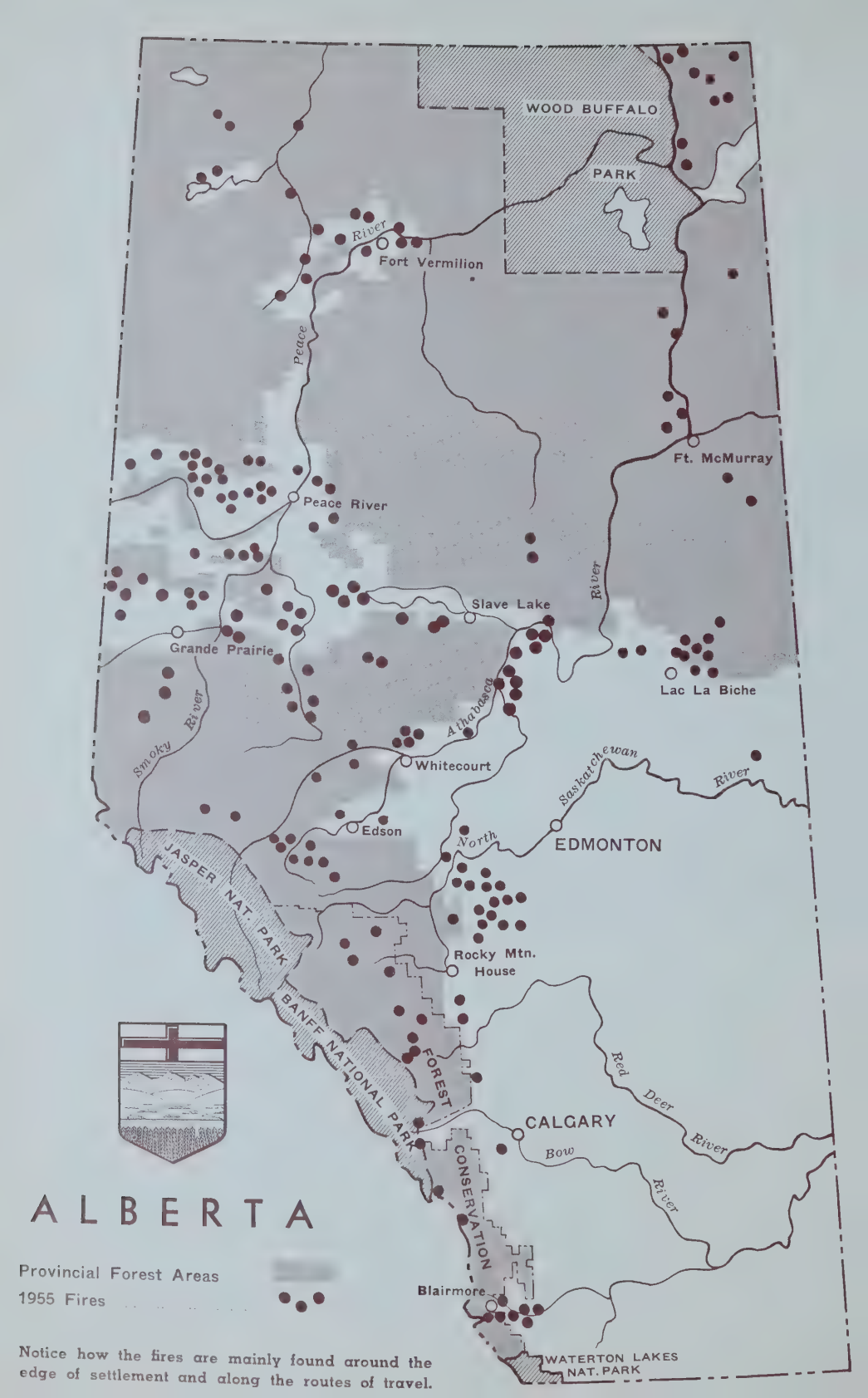
In all cases it is necessary to surround the fire with a strip of non-combustible material. This can be a road or a river, lake or swamp, but is usually a fire-guard made by scraping a line around the fire leaving only a belt of mineral soil over which the fire cannot burn. In the case of a crown fire, it is often necessary to wait until the fire stops crowning before the line can be made right next to the fire.

The work is done mostly by men using hand tools such as the shovel, axe and pulaski. Bulldozers and fire pumps are a great help, but very often are not available or impractical. Hacking out a fire line is hot, dry, dirty and very tiring work with long hours and little sleep.

If more people could experience the life of a fire-fighter, there would probably be a lot fewer fires !

When the fire has been corralled and finally extinguished, when the fire crews have been laid off and the ashes have grown cold, the ranger still has a mountain of work ahead of him. He must first return all the equipment to his cache in clean condition and in top working order in readiness for any other fires that may crop up. The accounts and pay slips in reference to the fire must be drawn up and submitted. Finally, the ranger must write a complete report on the fire giving its cause, rate of spread, final size, size of the fire crew, and so on. He must also map the fire and assess the damage to timber and other stands although aerial photographs help him a great deal in this respect.

Is it any wonder that the ranger is referred to as the backbone of the Forest Service.



ALBERTA

Provincial Forest Areas

1955 Fires

Notice how the fires are mainly found around the edge of settlement and along the routes of travel.

INSECTS AND DISEASE

LESS SPECTACULAR than fire but often equally or even more destructive than fire, are the insect pests and diseases that prey upon the forests. Insects and diseases are present in any stand of trees but are usually held in balance by natural forces. Occasionally a population will break away from its restraining forces and in its quest for increasing food requirements will begin to do increasing damage to the trees.

Insects are of many types in respect to their feeding habits. Usually it is the insect larva that does the damage, although the adult can also be harmful on occasion. No part of the tree is exempt from insect attack, for insects will attack roots, bark, wood, trunk, leaves and needles, buds, and even sawn logs.

One of the most important insects at the present time is the Larch Sawfly, so called because the female saws a slit into the twigs to lay her eggs. The eggs hatch into larvae which feed on the needles. In the badly infested areas there have been enough larvae to completely strip the needles off the trees. When done for several years this has resulted in the death of many of the trees. The Sawfly can now be found in almost every larch growing area in the province.

The Spruce Budworm is the most destructive insect enemy of balsam-spruce forests of eastern Canada. It has been building up near Wadlin Lake but has not yet reached serious proportions. A severe outbreak seems to be building up in the Mackenzie River country as well.

The budworm moth lays her eggs on the needles in mid-summer and the young larvae hibernate over-winter on the tree. The following spring they mine the needles or male flower buds and transfer to the new foliage as it develops. Repeated attacks will weaken the tree and reduce its growth. If continued for five or more years the tree will die. Aerial spraying of DDT is being used as a control method in New Brunswick but it is not considered necessary at present in Alberta.

The Lodgepole Needle Miner is another defoliating insect found in Alberta and is mainly located in the Rocky Mountain parks. These insects have not caused

Lodgepole pine killed by the Mountain Pine Beetle. Notice how the spruce trees remain unaffected

A tree canker.

mortality of trees but will weaken them greatly, reduce their rate of growth, leave them susceptible to attack by other insects.

The Mountain Pine Beetle is what is known as a bark beetle. It lays its eggs under the bark. The larvae hatch and feed between the wood and the under side of the bark. As they progress, the tree is gradually girdled and death of the tree usually results in one year. Fortunately this insect is not now present in serious numbers.

Many other forest insects are found in Alberta but no serious damage is resulting from their activities. The insect survey is designed to keep track of these insects and to study methods of controlling them if the need should arise.

DISEASES

Four of the most important types of diseases found in Alberta forests are decays, cankers, dwarf mistletoes, and foliage diseases.

Decays are the most common and most destructive of our disease problems in commercial forest stands. Rots greatly affect the merchantability of our commercial species and in some cases will be so severe as to make the trunk too weak to support the tree so that it falls down.

Rots can occur in all parts of the tree and are usually named in relation to their position in the tree such as root rot, butt rot, sap rot, and so on. Rots increase with the age of the stand so the best control is to harvest the timber stands before the amount of rot reaches serious proportions.

Canker diseases are also found in all parts of the Province but are reaching serious proportions in the Robb-Coalspur area and in the Waterton Lakes country. Pine stands valued for poles, pulpwood and recreation are seriously affected. The canker is a type of open sore in the bark that grows and eventually kills the tree by girdling it.

Dwarf mistletoe is kin to the favorite New Years greenery, but it finds no favour with the forester. The plant is a parasite on coniferous trees, that is, it grows by feeding on the host tree. Its action causes reduced growth, allows wood destroying fungi to enter the tree, causes deformity and often death of the tree results. Present control consists mainly of the removal of infected trees to prevent the spread of the parasite. Pathologists are currently studying two kinds of fungus which are parasitic on the mistletoe. These, if successful, would tend to keep the mistletoe under control through natural means. Direct control through the application of chemicals is also being investigated.

Foliage diseases, too, can be found in all parts of the forest with a few areas being more severely infected. They include needle casts and needle rusts in conifers and leaf spots of the broad-leaved trees. The result of infection is usually a loss of growth and weakening of the tree's resistance to attacks by other organisms. Infected needles turn a yellow-red or brown, then grey, with reddish or black dots on them. The needles drop off early.

LOGGING

IN ADDITION to the depletion through fire, insects and disease, is the annual harvest of wood and wood products from the forest.

During the operating year 1954-55, for example, the equivalent of over 464 million board feet of lumber was removed from Alberta's forests.

Logging is not a scourge by any means. It is, in fact, both beneficial and necessary, silviculturally and economically speaking. Logging is the means of harvesting the forest growth. Without logging, the older trees would just decay and die providing nothing but a source of infection for the younger trees.

Logging operations are carried on throughout the forested area varying in size from the settler falling a snag for fuelwood to the lumbering operations, involving millions of board feet. Trees are cut for fenceposts, building logs, plywood, lumber, pulpwood, telephone poles, and tent pegs just to mention a few uses.

The disposal of timber on Crown lands is controlled by the Forest Management branch. In addition to the License Timber Berths which are strictly for commercial timber operations, are provisions for miscellaneous types of permits allowing certain individuals the right to cut limited amounts of timber for specified uses. Most of the timber is cut under License Timber Berths although the pulpwood lease will also account for a large volume of wood.

Applications for timber are generally made by the mill operator who will make a request for a specific patch of timber in anticipation of his future requirements.

Applications are first passed by the field staff, then forwarded to Edmonton to the Forest Management branch for further checking and clearance.

The Forests Surveys branch then has one of its photogrammetrists prepare a forest cover map from aerial photographs of the area in question. These maps at a scale of four inches to one mile serve as a basis for the timber cruise which is then done by the field staff. In addition to the volume figures obtained during the course of the cruise, data is recorded as to age, growth and health.

If the stand is still young, growing well and is healthy, the application will, in all probability, be rejected. This would be done so that the timber would have a chance to reach its most economical size and growth.

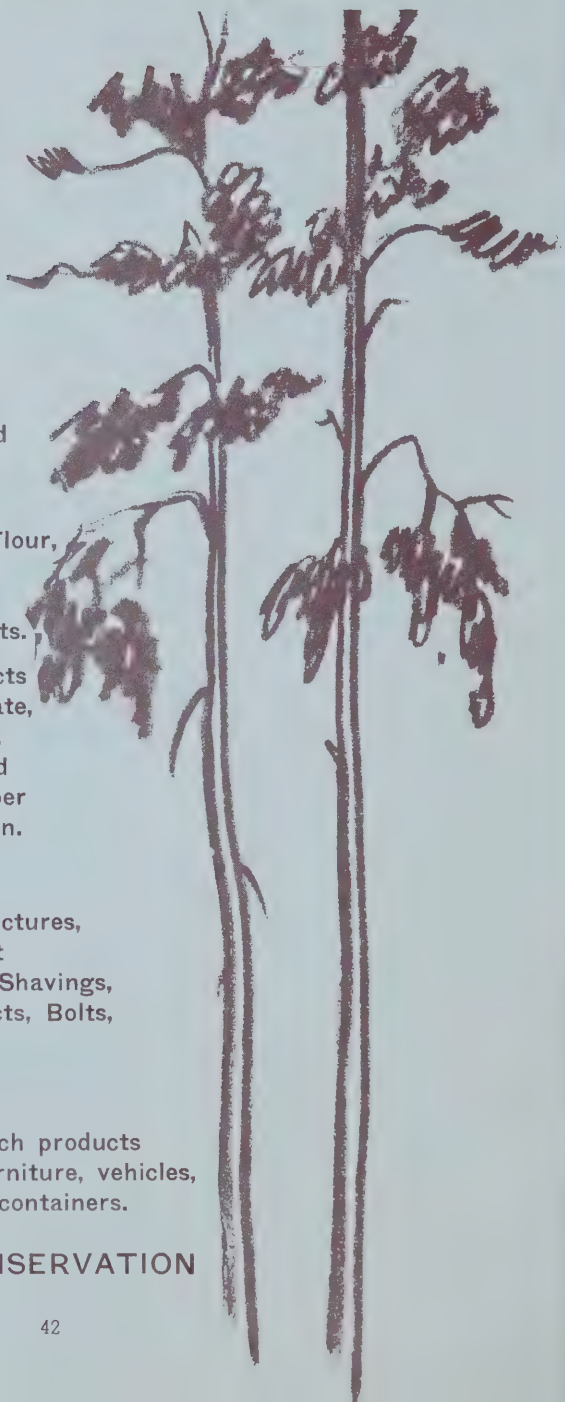
When the Forest Officer examining the timber decides that it should be harvested, he will then prepare a list of recommended cutting regulations. These are based on sound forestry practices and are designed to ensure that no damage is done to the soil or the remaining trees and to provide as favorable as possible a seed bed for the next crop.

The regulations are incorporated into his cruise report which is then approved by the forest superintendent and forwarded to the Forest Management branch. After further processing and approval by the branch the timber is offered for sale by sealed tender or public auction. The successful bidder can then commence logging operations while conforming to the cutting regulations and to the Forests Act.

Dues are paid to the crown on all products cut and can be based on the volume of the manufactured products sold or on the basis of a log scale.

In order to make sure that our forests are not cut too heavily in the future, the forested area is being divided into Forest Management Units as a part of the Forest Surveys branch planning program. On these areas the expected growth per year is calculated and the annual depletion held to the same amount.

PRODUCTS OF ALBERTA FORESTS



VENEER

including Package, Construction, Aircraft, Compregnated and Miscellaneous Plywoods and Fancy Veneers.

WOOD CHEMISTRY

from bolts, limbs, edgings and stumps come Hardwood and Softwood Distillations and Extractives.

from sawdust comes Wood Flour, Wood Hydrolosis, Fusion, Oxalic Acid and Plastic Moulding Powder and Sheets.

from wood pulp comes products of such processes as sulphate, sulphite, soda, groundwood, and by-products of dissolved cellulose products, and paper manufacture and conversion.

MISCELLANEOUS

Poles and Posts, Rustic Structures, Ties, Timbers, Pilings, Split Products, Fuel Wood, Mill Shavings, Bark, Sap and Gum Products, Bolts, Sawdust, Edible Fruits.

SAW LOGS

Construction Lumber, and such products of Industrial Lumber as furniture, vehicles, machinery and equipment, containers.

SOIL AND MOISTURE CONSERVATION

CONSERVATION AND REGENERATION

TIMBER and other products of the forest are a crop. This is the underlying thought of all forest management or conservation work. Trees must become seeded, take root, grow to maturity and be harvested the same as with any other crop.

The difficulty in planning lies in the fact that the crop takes 125 years or more to grow depending on the end product in mind. With the large volume of "growing stock" that has to be kept on hand at all times it is sometimes hard to imagine such things as "over-cutting" and "excess fire loss".

The Forests and Wildlife division is striving to keep the annual depletion equal to the annual growth so our forests will neither become depleted nor will they stand too long, become unhealthy and go to waste.

The balance between growth and depletion is a tricky one to find and studies are being made along those lines by the Forest Surveys branch in co-operation with the Forest Management branch. During the summer months the forest engineers take field parties into the forest to study such things as growth, age, health and volumes of stands, thereby obtaining a wealth of information vital to proper forest management.

While the farmer can systematically seed his land from year to year, the forester must depend on natural seeding to establish his next crop. The cutting regulations in connection with various logging operations are designed to accomplish this and they are applied to suit specific conditions. Planting trees by hand or by machine has been found too impracticable for Alberta's conditions and seeding by air is still pretty well in the experimental stage.

In a stand of timber that contains trees of all sizes from seedling to old "vet", a stump diameter limit might be imposed or possibly a Forest Officer would mark the trees that should be logged. This would allow the older and bigger trees to be taken out leaving room for the smaller ones to grow. The remaining trees would also seed in the open spaces and get the next crop started before they themselves were cut.

Where the trees are all about the same size and age, a different approach must be made. Usually small patches or strips of timber are marked on which all the trees are cut. The remaining trees then provide seed which blows into the openings. When young growth is established on the cut-over areas, then the rest of the timber may be cut. Both methods of cutting provide protection for the soil as well as for the residual stands.

The various cutting methods in use have been developed through experience gained in observing the results of old logging operations and as a result of the findings of the Forestry Branch in its experimental cuttings.

In contrast to the forces of depletion, the forest is at constant work in an effort to grow and expand its range. Many shallow lakes have slowly become filled in to become swamp or muskeg. The small, stunted black spruce and tamarack growing out into them are the first beginnings of a new forest. Slowly the soil will be built up and more and more trees will grow until, in thousands of decades hence, the old lake will scarcely be recognizable.

Or consider the twisted pine growing in a crack in the rock. It and its kind are slowly breaking down the rock and creating soil. Here again, in thousands of years, forest will grow where now there are none.

Fire, however, can undo in seconds what has taken nature thousands of years to achieve.

THE FOREST INVENTORY

AT THE TIME of the first logging operations in Alberta, the forests were considered as virtually inexhaustable. As cutting and burning increased, a few began to wonder just how much timber there actually was. These men were joined later by others who wondered how much annual depletion Alberta's Forests could stand and still produce merchantable timber in perpetuity. When the necessity of a forest inventory became fully realized, the province entered negotiations with the Photographic Surveys Corporation and a contract was signed in late 1949.

Under the terms of the contract, the PSC took aerial photographs of the whole province at a scale of 3333 feet to one inch (about 2 inches to one mile) and photographs at a scale of 1320 feet to one inch (4 inches to 1 mile) on the forested area south of the 57 parallel (township 92). Planimetric maps were made from the 3333 photographs which served as base maps for the field work and which in turn formed the base for the forest cover types.

They then took an inventory of the forests south of township 92 interpreting the forest cover on the 1320 photographs and transferring it to the 3333 maps.

The field work took three seasons and in May of 1953 all the maps and volume information were at hand.

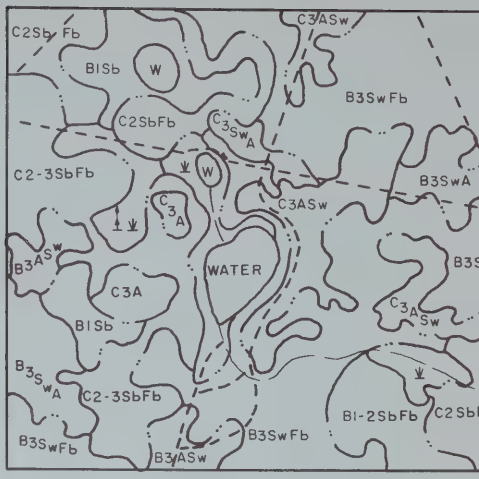
The Forest Surveys Branch then undertook to make the inventory on the area north of township 92. Fieldwork was done during the summers of 1953 and 1954 and the map making and compilation on this portion was completed in March, 1956.

Forest interpretation was done on the 3333 scale photos but the work was greatly assisted by the larger scale pictures which were taken on the more valuable timbered areas.

Because of the importance of a Forest Inventory, the federal government has made agreement under the Canada Forestry Act to share the cost of this project with any province that so wished. Alberta began her inventory two years before the Act was passed but joined the scheme when it was made available.

The inventory is being developed in two stages. The first stage which is now finished gives a broad picture of the forest resouces showing the productive acreage of forest land and the approximate volumes of timber. The forest area handled by the

The increment borer reveals the tree's age, rate of growth and state of health.



n aerial photograph and the forest cover map at was made from it. The symbols represent the ensity, height and species composition of the forest ands.

Forests and Wildlife division was mapped showing the kind of forest or other growth, its location and extent.

Considering the large area of the forest and the small staff at hand to do the work, this first stage was of necessity a broad type of project.

The second stage which is now in progress involves the detailed mapping and sampling of areas that the first study showed were important.

To accomplish this, almost every device and tool known to foresters is brought into play.

The basis of the whole project is the vertical aerial photograph. As is shown in the illustration, the photos contain a wealth of information and the forest cover can be interpreted into terms of species, heights and densities.

Armed with these maps and photographs, forest survey crews under the leadership of trained foresters venture out during the summer months of each inventory year to check the interpretation and to cruise the forest stands to find their volume per acre, age, height and rate of growth.

Cruising is done by laying out a small plot (usually about 1/10th or 1/4 acre) in a stand and then recording each tree in the plot according to its species and diameter at breast height. (DBH). The heights of several of the taller trees are measured by means of an Abney hand level. The increment borer which removes a core of wood from the tree is used to determine the age, soundness and rate of growth.

Compilation of these factors gives the stand volume per acre. The average volumes of stands that have been cruised can be applied to the same kind of stands in areas where no sampling was done. In this way a volume figure is determined for map sheets, management units and for the whole province.

Records have been kept on a punch-card machine system so that a running inventory will be kept.

As a result of the experience gained in making the inventory, the Forest Surveys branch is well equipped to do the photo interpretation and map making on areas under application for timber berths.

BENEFITS OF THE FOREST INDUSTRY

WOOD is amongst the most commonly used materials in daily life. We step out of bed — very likely a wooden one — on to a wooden floor and proceed to take breakfast at a wooden table. While we read the morning paper which is a product of wood, as also is the ticket with which we pay our bus fare. At the office we sit on a wooden chair behind a wooden desk placed on a wooden floor. Wood constitutes a large part of our homes, both in the building and its furnishings. The wife's rayon clothing once grew in a forest and her husband's shirts, too, may once have been a product of the woodlands. Our cigarette packages are wood products; so is the cellophane wrapping around them. So possibly is the linoleum on the kitchen floor, the safety glass windshields, turpentine, plastic, French ivory, photographic film . . . all derivable by the magic of modern alchemy, from wood.

In 1952, Alberta forests largely supported the 1,100 wood products firms in the province, providing employment for approximately 6,700 persons with an annual payroll of $12.7 million. All told, $58 million worth of goods and services were the result.

The Wood and Paper industry is the third largest industrial grouping in the province, and the economic returns to the province will become much greater when the pulp and plywood industries become well established.

Sawmilling accounts for the greatest volume of timber at the present time although pulpwood will soon be chipped up at the rate of 300,000 or more cords per year.

One of the oldest established forest industries in Alberta is the tie industry. Ties from our pine forest served an era of intense railroad building. But the picturesque tie hacker who could "hew to the line" left a littered residue of chips and other debris on the forest floor which constituted an undue fire hazard. The practice was therefore discontinued in favour of mill-sawn ties.

Plywood mills are fairly new to Alberta. Poplar or Balm and Aspen are the main species used. Eight-foot bolts of wood are placed in a lathe and revolved. An eight-foot-long knife is pressed against the bolt and a long thin sheet comes peeling off. These sheets are cut up and dried, then sandwiched together with special glues to make plywood.

The alternate wet and dry seasons in Alberta cause unprotected poles and posts to rot quite rapidly in the ground. This has given rise to the Wood Preservation industry which has a good source of material in Alberta's extensive pole-sized stands.

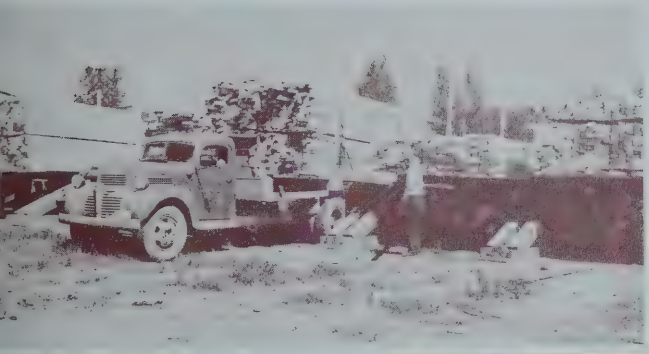
Telephone poles, fence posts, railroad ties and other timbers that contact the ground can be treated by dipping the timbers in preservative solutions and letting them soak it up. In other processes, the preservative is actually forced into the wood by using air pressure. The results have

shown that it is well worth while to treat timbers as years are added to their lives.

Other firms in the province use wood to make boxes and crates, or furniture, or to shred up into excelsior for use in packing fragile articles.

The graceful and symmetrical wooden structural arches seen in many of the modern churches and auditoriums are now made in Alberta. The arches and beams are made up of hundreds of pieces of wood which have been pieced together and bonded with special glues to form a laminated structure of exceptional strength and resilience.

It is rather frightening to think that these forest industries contributing so much to our economy can be slowed down or closed up completely because of a few careless people who neglected the simple rules of fire prevention.



Alberta's forests produce lumber . . .

. . . plywood . . .

. . . poles and posts. . . .

. . . and pulpwood, among many other products.

TRAPPING

EVERY FALL thousands of trappers head back into the forest and fringe areas of Alberta to reap the harvest of rich furs produced in and around the woodlands.

During the trapping season of 1954-55, for instance, there were 2,484 registered trap-lines and 6,181 licensed trappers. Direct revenue to the province from licenses and registration fees, and fur tax collections that same year was over $182 thousand. The value of the furs produced came to over $2 million.

The forest is related directly to the production of most furs. The carnivores depend on the herb-eating rabbits and seed-eating squirrels for food while they in turn need the forest for food and shelter.

The beaver and muskrat are often found together, both being fond of water. Large burned-over watersheds with their irregular and heavy runoffs accompanied by silting are discouraging to these animals who will often move out for "greener" pastures. It is essential in respect to all aspects of trapping to keep our forests green and healthy.

Forest Officers work closely with the trappers.

AESTHETIC

TO ANYONE that loves the wilds there is nothing uglier than an area that has been burned over. To be just it must be admitted that there is a certain beauty in the riot of vivid reds and yellows in the fall of the year among the invading fireweed and deciduous growth. Such beauty is transitory, however, and soon lost among the stark, charred, naked snags that disfigure the setting. Large fires can wipe out favorite or accessible camping grounds, view points, and fishing sites, resulting in overcrowding of others and loss of the very solitude which so many seek. Packers, outfitters and guides, and guest ranch operators and tourist people depend for their livelihood upon this urge to get into the woods to hunt, to fish, or simply to enjoy the peace and contentment that nature offers. It has been said that there can be no finer use for our forested lands than for recreation, with its ultimate crop being the spirit of the people.

The crowded highways leading to our resort areas and the number of hunting and fishing licenses issued each year speak quite eloquently of the aesthetic attraction of our forests.

Perhaps this asset, impossible to evaluate in terms of dollars, is worth more in its aesthetic form than the value of all the timber contained in it.

AGRICULTURE

THE IMPORTANCE of forestry to agriculture has been recognized on the prairies as far back as 1899 when the old Forestry Branch established nurseries for the production of tree seedlings for distribution to prairie farmers.

This early recognition of the importance of trees has paid great dividends. The trees planted have now grown to provide shelter and shade for farmsteads. They have helped to prevent snow and soil from blowing in the winds and have aided in conserving moisture in the soil.

The direct benefits offered by shelterbelts can be readily seen. Not as apparent, however, are the effects of the forests on the headwaters of the great Saskatchewan river. In 1910 the forests on the headwaters of the Saskatchewan river were surveyed and a reserve made of them. The value recognized then and confirmed today is that these forests help to promote the maximum runoff spread out over the year. As a result hydro-electric power plants are assured of ample water, irrigation projects are possible, and cattle need not suffer from prolonged drought.

More tangible results of the forest may be seen in the miles of fence posts, power poles and farm buildings. No matter how remote the forest may seem, it is always close.

In the areas being opened to settlement careful surveys should be made of the soil and timber to determine beforehand the crop which would be best suited to the land, trees or agricultural produce. On lands open for settlement, the settler is required under the conditions of his Homestead Lease to leave a minimum of 20 acres of natural cover on each quarter section of land contained in his lease.

It is also suggested by the Lands division "that a protective area of natural cover be left by the lessee on slopes too steep for convenient cultivation, on and around unproductive land such as muskegs, sand ridges, etc., beside water courses, sloughs and drainage areas required for dugouts. It is also suggested that small patches of timber be preserved for woodlots."

By the time the settler gains title to the land it is presumed that he will have learned to fully appreciate the timber as protection for his cattle, as fuel, as a windbreak, as material for his fence posts and a means of accumulating snow during winter months. Even after he has patent to the land and is no longer bound by homestead lease he will, if he is wise, still retain some patches of trees on his land.

Grazing is provided for thousands of head of cattle.

THE ROCKY MOUNTAIN FOREST RESERVE

THE RESERVE of nearly 9,000 square miles is under the control of a joint provincial-federal agency called the Eastern Rockies Forest Conservation Board. The three-man board was set up in 1947 under a 25-year agreement between the Province of Alberta and the Government of Canada.

The Board's chief objective is to maintain good watershed conditions and obtain high water yields. In accomplishing this, special attention is given to maintaining a good cover of trees, grass, or other vegetation as insurance against soil erosion and to minimize the danger of flash floods.

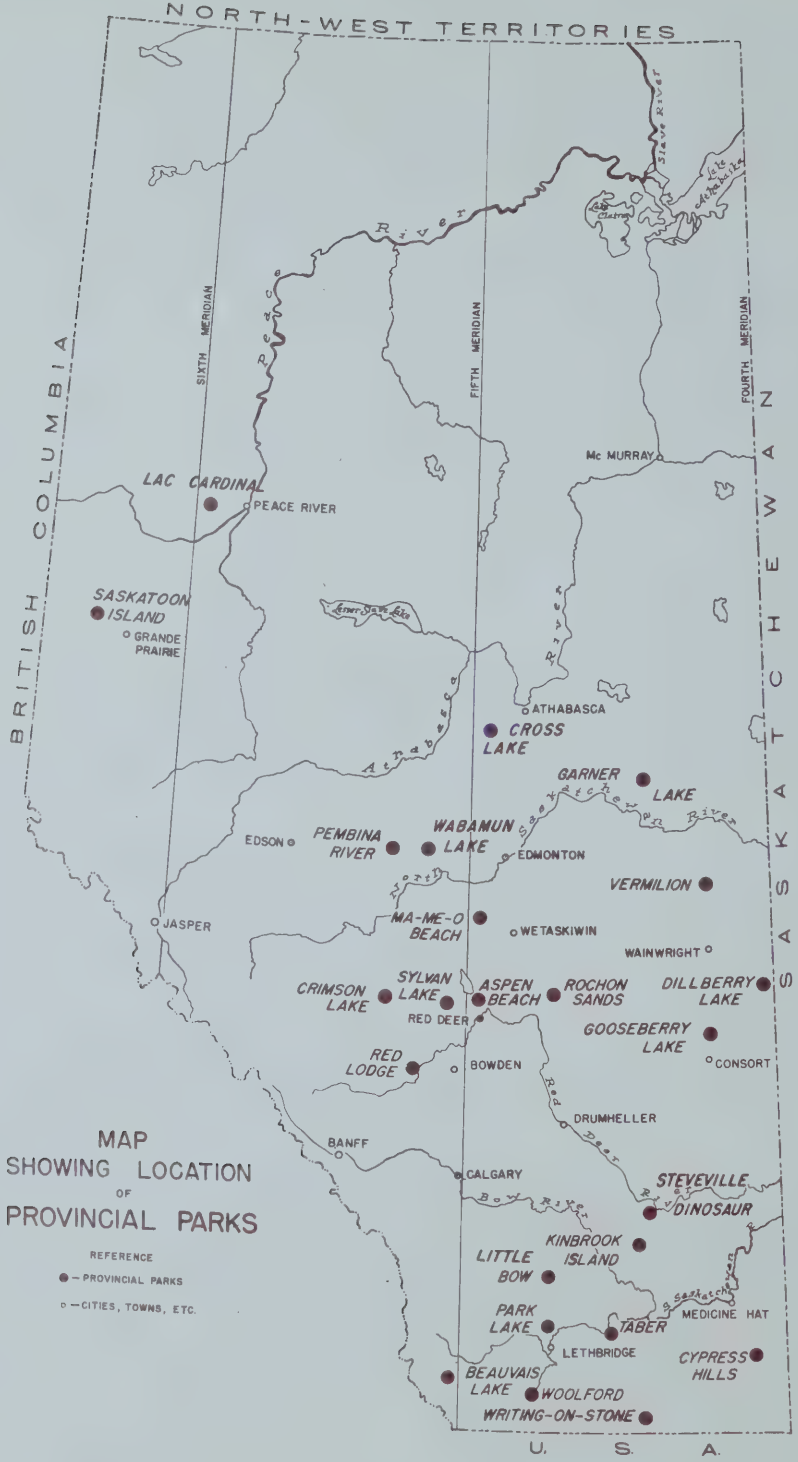
The reason for the concern over watershed and water yield is that the Reserve, along with the Waterton, Banff and part of Jasper National Parks, supplies by far the greater portion of the Saskatchewan River water. The Saskatchewan flows through the grassland plains of Alberta, Saskatchewan and Manitoba, an area of low precipitation where water is in limited supply. Since the availability of water determines the limit

TRAVEL PERMITS MUST BE
CARRIED WHILE ON A RESERVE
SIGN IN CHECK OUT

of industrial expansion and the ultimate level of population, it can be readily seen that the Board holds a large responsibility.

Although the Reserve is managed primarily for water, it plays an important part in the economy of the surrounding region. Upwards of 60 million board feet of timber products are cut each year by local timber operators and the rich grazing areas support over twenty thousand head of cattle and many sheep and horses. The magnificent scenery, clear streams and excellent game cover makes the Reserve a haven for tourists as well as for fishermen and hunters.

The Forest Reserve helps to maintain high water yields to supply power stations, cities and towns, and irrigation needs.


NORTH-WEST TERRITORIES
BRITISH COLUMBIA
SASKATCHEWAN
U. S. A.
SIXTH MERIDIAN
FIFTH MERIDIAN
FOURTH MERIDIAN
Peace River
Slave River
Mc MURRAY
LAC CARDINAL
PEACE RIVER
SASKATOON ISLAND
GRANDE PRAIRIE
Athabasca River
ATHABASCA
CROSS LAKE
GARNER LAKE
Saskatchewan River
EDSON
PEMBINA RIVER
WABAMUN LAKE
EDMONTON
VERMILION
JASPER
MA-ME-O BEACH
WETASKIWIN
WAINWRIGHT
CRIMSON LAKE
SYLVAN LAKE
ASPEN BEACH
ROCHON SANDS
DILLBERRY LAKE
RED DEER
GOOSEBERRY LAKE
CONSORT
RED LODGE
BOWDEN
Red Deer River
DRUMHELLER
BANFF
CALGARY
Bow River
STEVEVILLE
DINOSAUR
KINBROOK ISLAND
LITTLE BOW
Saskatchewan
MEDICINE HAT
PARK LAKE
TABER
LETHBRIDGE
CYPRESS HILLS
BEAUVAIS LAKE
WOOLFORD
WRITING-ON-STONE
MAP
SHOWING LOCATION
OF
PROVINCIAL PARKS
REFERENCE
● — PROVINCIAL PARKS
○ — CITIES, TOWNS, ETC.

PROVINCIAL PARKS

UNDER the Provincial Parks Board, which was set up in 1951, twenty-four provincial parks have been established. The parks are located in areas where they will serve as recreational areas designed for the whole family, or, in some instances, to preserve some spot of geological, historical or other particular interest.

The Superintendent of Parks is responsible to the Board for the maintenance and operation of existing parks as well as planning for their orderly development and improvement.

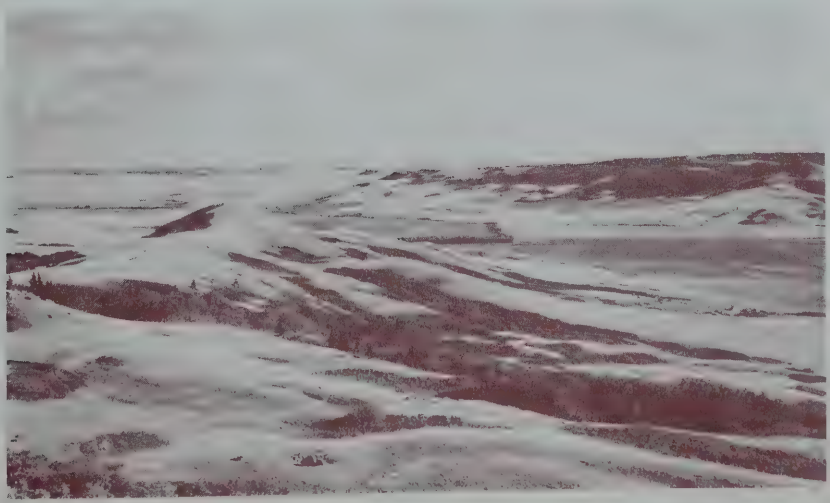
A very important part in the operation of the parks is played by the local advisory committees. Each park is operated under the guidance of a committee of three local residents who donate their time and effort in the endeavor to provide the best possible facilities at the park in their community. The help of these public-spirited men is recognized and greatly appreciated.

The parks are designed to serve an area within a roughly 50 miles radius. There are no charges for admission to the parks and the policy is to provide as complete facilities as possible to enable a family to vacation at as little expense as possible. Reservations have been made for future parks but these will be developed only as the need for them arises.

With one exception the parks are unimportant in respect to timber production. Cutting on most park sites is restricted to clearing for improvements or removal of unhealthy trees. On these areas the forest stands are managed primarily for their scenic value.

The one exception is the Cypress Hills park which covers about 77 square miles in the south-eastern corner of Alberta. The park joins the Saskatchewan provincial park of the same name and is an important local source of supply of the smaller forest products such as fenceposts, poles and fuel wood. The forest management policy of this area is designed to meet as much of the demand for wood as possible while still preserving the forest cover and natural beauty of the region.

The largest Provincial Park is the Cypress Hills.



NATIONAL PARKS

ALMOST 21 thousand square miles of Alberta's forest area is contained within the boundaries of National Parks. These parks were all established before the 1930 transfer of resources agreement for the "benefit, education and enjoyment" of the public. The National Parks Act also states that the parks are to be "maintained and made use of so as to leave them unimpaired for the enjoyment of future generations."

The oldest park is Banff which was established in 1885. Banff was followed by Waterton Lakes in 1895, Jasper in 1907, Elk Island in 1911 and finally by Wood Buffalo in 1922.

Wood Buffalo Park was established primarily to provide grazing areas for the wood buffalo. Since the park is not being managed for the preservation of scenery, it is probably the only national park which permits commercial timber operations.

The only timber operations allowed on the other parks are thinnings designed to remove dead or diseased trees, or thinnings to make dense stands more attractive.

". . . to the cool, moist Spruce forest."

MEET THE ALBERTA TREES

THE TREES you are about to meet are the most important ones to Alberta. Look for them next time you are in the woods.

Two main groups of trees are recognized; the trees with needle-like leaves (often referred to as "Christmas Trees"), and the broad-leaved species.

The first group to be described is coniferous or cone-bearing family. These are the most important ones economically and, with the exception of the Tamarack, are evergreens.

White Spruce

By far the most important of the Alberta species is the White Spruce. This tree accounts for about three-quarters of the annual cut of the province.

White Spruce can be found from Newfoundland to Alaska and it extends over the entire forested area of Alberta.

It prefers moist but well-drained, sandy or gravelly soils and is often found growing along streams and lakes or on the nearby slopes.

The leaves or needles are sharp-pointed, blue-green, four-sided and twist up to the upper side of the twig. The cones are narrow in proportion to their length with flexible and smooth-edged scales. Trees have attained sizes of up to 140 feet high and 4 feet in diameter.

Its wood is characterized by a clean, smooth texture combined with strength and lightness which finds favour in construction of every kind. Some common uses are interior finishes, floors, boxes, boats, light and medium construction, and pulpwood.

Engelmann Spruce, which is similar to White Spruce, is found along the Rocky Mountains. Its uses are the same as for White Spruce and the similarity is pointed up by the fact that where White Spruce and Engelmann Spruce grow together, hybridizing is common.

Black Spruce

Less important, but equally common is the Black Spruce, the most valuable tree for the manufacture of pulpwood for newsprint. Its leaves are blunter pointed than the white spruce, blue-green in colour, dull, and spread out in all directions. It has an almost round cone when the scales are open. The scales are very stiff and hard with roughly-notched edges. The crown is rather sparse with short, drooping branches.

This is a slow-growing tree found amongst rocks and swamps where other species cannot exist. The wood is quite hard, heavy and strong. It has been used for mine timbers and fenceposts, but is now in demand as pulpwood for which it is ideal.

" . . . and from park-like stands of pine."

The Pines

All Alberta pines are evergreens and bear long, needle-like leaves which always occur in groups of two or five. The two species most commonly found in Alberta are the jackpine and lodgepole pine. Both are adapted to a wide range of growing sites although the lodgepole pine usually grows at altitudes from 2,000 to 5,000 feet. Jackpine cones are short, pear-shaped and curved in towards the branch, often occurring in pairs. They may cling to the trees many years without opening. The lodgepole cones are very similar but usually have slender prickles on the cone scales.

The lodgepole pine is the main tree at Jasper and Banff and the range extends to the Lesser Slave Lake area where it meets the Jackpine which grows mainly in the north-eastern part of Alberta.

In the transition zone where the two pines meet, a great deal of hybridizing occurs. The result is that many trees display the characteristics of both species.

The wood of the pines is in great demand for ties, mine timbers, poles, lumber, and now, for pulpwood. The tree grows quite rapidly and reproduces its kind prolifically, particularly in sandy, burned-over land.

Two other species of pine are found along the higher elevations of the Rockies. These are the Whitebark and Limber pine. Both are five-needle pines and are generally of non-commercial size.

Balsam Fir

This is one of the trees peculiarly characteristic of cold, northern climates requiring moisture and shade to reach its maximum size. Its leaves are flat, very blunt and whitish underneath, and are arranged on most of the twigs in two ranks so that the whole twig and leaves have an upper and lower side, green on top and whitish on the bottom. The bark, especially on young trees, is usually covered with conspicuous blisters full of a clear, sticky liquid called balsam gum. The cones are two to four inches long and about one inch in diameter. They are purplish in color and stand erect at all times.

Its principal use is in the manufacture of pulpwood and in the construction of boxes and crates.

Alpine Fir is found along the Rocky Mountains. Its description and uses are about the same as Balsam Fir although it prefers higher elevations.

Tamarack (Larch)

This is the source of a very durable, hard wood used chiefly as bridge timber and floorings, fence posts and poles. It is, however, particularly susceptible to attack by the larch sawfly whose depredations upon the species may be most devastating over a period of years.

It is easily recognizable in winter because it sheds its bright green needles borne in bundles of from twelve to forty. The cones are very small, about one-half inch in length with about twenty brown scales.

Another species called Alpine Larch is found along the southern Rockies growing at around 5,000 feet or more. Although it has little commercial value it is important in helping to control run-off erosion.

Douglas Fir

Douglas Fir is found in limited quantities along the east slopes of the Rockies from the international border to the Athabasca River.

Although it is famous for its strength and durability in building construction, it is relatively unimportant in the economy of the province.

It can most readily be identified by its thick corrugated brownish bark.

. . . The following trees are called broad-leaved or deciduous since they lose their leaves in the fall :

Poplars

The poplars are medium to large, fast growing, moisture-loving trees.

The trembling aspen (or white poplar) covers the most extensive area of any tree in North America. It is found on a wide variety of soils, particularly on burned-over areas. It often acts as a nurse crop for spruce or pine.

Its leaves are nearly circular, abruptly pointed, fine-toothed with rounded teeth and are borne on long, slightly-flattened stalks. This flattening causes the leaf to tremble in the slightest breeze.

The balsam poplar (black poplar or Balm) also covers a very extensive area of North America being most commonly found on rich, moist soils such as on the banks of streams, bottom lands and river islands.

Its leaves are oval or heart-shaped, larger than those of the white poplar, dark green on top and lighter below. The leaf stems are round.

The wood of both poplars is used for matches, furniture, excelsior, lumber, fuelwood and pulp, and is in great demand for veneer for plywood making.

White Birch

This species is found in nearly every part of Canada. It is a medium-sized tree with the well-known paper-like bark which can be removed and split into thin sheets. This bark provided the material for the birch-bark canoe, coverings for wigwams and utilities famous in the romance of the frontier. Its wood is valuable for high quality plywood, furniture, flooring and fuelwood.

In addition to these commercial species are other poplars and birches as well as junipers, alders, willows, cherries and others. They are of little commercial value, although they do find a place as soil retainers, food or ornamentals.

CO-OPERATING AGENCIES

THE FORESTS, forest uses, forest protection and other aspects of forestry have a direct effect on the welfare of many people and indirectly effect many thousands more. This fact is reflected in the memberships of many organizations wholly or partly dedicated to assisting the provincial government in protecting and in promoting wise usage of our forests.

The Canadian Institute of Forestry is a nation-wide organization of professional foresters and others vitally interested in forestry. The Alberta members belong to the Rocky Mountain Section and are constantly striving to find ways to improve forestry practices and to promote their use so our forest lands will produce more and better timber.

The Canadian Forestry Association, to use its own words, ". . . is an independent, non-profit organization, devoted to securing public co-operation in the wise use and management of our renewable resources of soil, water, forests, and wildlife. It is entirely supported by voluntary donations." The CFA is also a national organization, and, although non-technical in nature, is very active especially in the field of public education. Awareness of our renewable resources and interest in them is encouraged by such programs as provincial-wide forest fire poster contests, distribution of informative literature and tours made by the "Conservation Caravans", the tree-planting cars and more recently, the railroad Conservation car.

On some of the forested area rich grasslands prevail which provide grazing for many thousands of cattle as well as horses and sheep. In addition to the many regional stockman's and grazing associations common to these districts is the American Society of Range Management. The Alberta members belong to the International Mountain section. The society promotes good grazing practices and members are brought up to date on new techniques through the Journal of Range Management.

Fish and Game associations obviously have fundamental interest in the welfare of the forest and do a great service in encouraging careful use of the forest among their members and the public.

Agriculture organizations, Boy Scouts, schools, and many other groups all help in their own way to spread the word of conservation and to encourage the wise and proper use of our forests.

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